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22. (Amended) An information display comprising:
a transmissive layer;
a plurality of independently operable light emitting devices disposed to emit light through the transmissive layer, thereby being capable of displaying information to a viewer; and
a frustrator element comprising a microstructured surface to frustrate total internal reflections of light emitted the plurality of independently operable light emitting devices, the microstructured surface comprising repeating structures, wherein the transmissive layer is disposed between the frustrator element and the plurality of independently operable light emitting devices.

23. (Amended) The information display of claim 22, wherein the repeating structures comprises a plurality of prismatic structures.

A version marked up to show changes made to the claim(s) relative to the previous version of the claim(s) is attached.

Remarks

The Amendment and Remarks are in response to the Office Action dated August 14, 2002. Claims 7, 12, 22, and 23 have been amended. Claims 4-24 are pending. The Applicants thank the Examiner for indicating that claims 8-10, 20, and 21 are allowable. Examination and reconsideration of the application as amended is requested.

§ 103 Rejections

Claims 4-7, 12-15, 17-19, and 22-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 98/17083 to Horikx et al. (hereinafter "Horikx") in view of U.S. Patent No. 5,910,706 to Stevens et al. (hereinafter "Stevens") and Japanese Patent Application Publication No. JP 11-006905 to Kawano et al. (hereinafter "Kawano"). Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Horikx in view of Stevens. Claim 16 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Horikx in view of Stevens and Kawano and further in view of EP 0814621 to Stevens et al. (hereinafter "European application").

With respect to claims 4-6 and 13-19, independent claim 4 recites a volume diffuser with voids dispersed in a matrix material. The Office Action asserts that Kawano discloses the recited voids. The Applicants submit that Kawano teaches a light diffusing layer containing a resin binder and particulates with indentations formed into the layer using a solvent. These indentations are substantially different than the recited voids and, moreover, are not dispersed in a matrix material. The Applicants refer to a definition of “dispersion” from Hawley’s Condensed Chemical Dictionary, 12th Ed. (1993) (a copy of the page containing the definition accompanies this Amendment) which indicates that a dispersion is “[a] two-phase system, where one phase consists of finely divided particles ... distributed throughout a bulk substance....” In the invention of claim 4, the “particles” of the definition correspond to voids. In other words, the voids are disposed throughout, and surrounded by, the matrix material. Kawano does not teach dispersing voids throughout the light diffusing layer (although Kawano does demonstrate dispersing particulates throughout the layer), instead Kawano teaches modifying the surface of the light diffusing layer to make it substantially more rough and rugged. None of the other cited references teach or suggest a volume diffuser with voids dispersed in a polymer matrix. Accordingly, the Applicants submit that claim 4, and claims 5, 6, and 13-19 which depend from claim 4, are patentable over the cited references. The Applicants request that the rejections of these claims be withdrawn.

With respect to claim 11, none of the cited references teach or suggest the use of a frustrator element having a surface diffuser where the frustrator element is positioned so that a transmissive layer is between the frustrator element and the light emitting devices. The Office Action indicates that Horikx teaches the use of a volume diffuser, not a surface diffuser. Stevens does not address this deficiency of Horikx. Neither of the cited references teaches or suggests the invention of claim 11. Accordingly, the Applicants submit that claim 11 is patentable over the cited references and respectfully request that this rejection be removed.

With respect to claims 7, 12, and 22-24, independent claims 12 and 22 recite a frustrator element that has a microstructured surface. Claims 12 and 22 have been amended to clarify that the microstructured surface has repeating structures, as illustrated in Figures 5A and 5B of the present application. In other words, the microstructured film is a film that has at least one surface comprising a plurality of non-random structures. The Office Action asserts that Kawano teaches a frustrator with a microstructured surface. The indentations in the surface of the light diffusing layer of Kawano are random and are not presented in repeating manner. The Applicants submit that

Kawano does not teach the recited microstructured surface as clarified by the amendment to the claims indicating that the microstructured surface comprises repeating structures.

Moreover, dependent claims 7 and 23 recited that the microstructured surface comprises a plurality of prismatic structures. None of the cited references taught or suggested prismatic structures. In particular, the indentations in Kawano are not prismatic structures and would not be considered prismatic structures by those of skill in the art.

For at least these reasons, the Applicants submit that claims 7, 12, and 22-24 are patentable over the cited references. Accordingly, the Applicants request withdrawal of the rejection of these claims.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested. Allowance of claims 4-24, as amended, at an early date is solicited.

Respectfully submitted,

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Version with markings to show amendments made:

7. (Amended Twice) The information display of claim 12, wherein the [microstructured surface] repeating structures comprises a plurality of prismatic structures.

12. (Amended Twice) An information display comprising:
a transmissive layer;
a plurality of independently operable light emitting devices disposed to emit light through the transmissive layer, thereby being capable of displaying information to a viewer; and
a frustrator element disposed between at least one of the light emitting devices and the transmissive layer to frustrate total internal reflections of light emitted the plurality of independently operable light emitting devices, wherein the frustrator element comprises a microstructured surface oriented toward the transmissive layer, the microstructured surface comprising a plurality of repeating structures.

22. (Amended) An information display comprising:
a transmissive layer;
a plurality of independently operable light emitting devices disposed to emit light through the transmissive layer, thereby being capable of displaying information to a viewer; and
a frustrator element comprising a microstructured surface to frustrate total internal reflections of light emitted the plurality of independently operable light emitting devices, the microstructured surface comprising a plurality of repeating structures, wherein the transmissive layer is disposed between the frustrator element and the plurality of independently operable light emitting devices.

23. (Amended) The information display of claim 22, wherein the [microstructured surface] repeating structures comprises a plurality of prismatic structures.

disodium orthophosphate. See sodium phosphate, dibasic.

disodiumphenyl phosphate. $C_6H_5Na_2PO_4$.
Properties: White powder, soluble in water, insoluble in acetone and ether.
Use: Reagent for milk pasteurization.

disodium phosphate. See sodium phosphate, dibasic.

disodium pyrophosphate. See sodium pyrophosphate, acid.

disodium tartrate. See sodium tartrate.

disperse dye. See dye, disperse.

disperse phase. See phase (2); colloid chemistry.

dispersing agent. A surface-active agent added to a suspending medium to promote uniform and maximum separation of extremely fine solid particles, often of colloidal size. True dispersing agents are polymeric electrolytes (condensed sodium silicates, polyphosphates, lignin derivatives); in non-aqueous media sterols, lecithin and fatty acids are effective.

Use: Wet grinding of pigments and sulfur; preparation of ceramic glazes, oil-well drilling muds, insecticidal mixtures, carbon black in rubber, and water-insoluble dyes.

See also emulsion; detergent.

dispersion. (1) A two-phase system where one phase consists of finely divided particles (often in the colloidal size range) distributed throughout a bulk substance, the particles being the disperse or internal phase and the bulk substance the continuous or external phase. Under natural conditions, the distribution is seldom uniform; but under controlled conditions, the uniformity can be increased by addition of wetting or dispersing agents (surfactants) such as a fatty acid. The various possible systems are: gas/liquid (foam), solid/gas (aerosol), gas/solid (foamed plastic), liquid/gas (fog), liquid/liquid (emulsions), solid/liquid (paint), and solid/solid (carbon black in rubber). Some types, such as milk and rubber latex, are stabilized by a protective colloid which prevents agglomeration of the dispersed particles by an adherent coating. Solid-in-liquid colloidal dispersions (loosely called solutions) can be precipitated by adding electrolytes which neutralize the electrical charges on the particles. Larger particles will gradually coalesce and either rise to the top or settle out, depending upon their specific gravity.

See also suspension, colloid chemistry.

(2) In the field of optics, dispersion denotes the retardation of a light ray, usually resulting in a

change of direction as it passes into or out of a substance, to an extent depending on the frequency. Dispersion is a critically important property of optical glass.
See also refraction.

"Dispersite" [Uniroyal]. TM for water dispersions of natural, synthetic, and reclaimed rubbers and resins.

Use: Adhesives for textiles, paper, shoes, leather, tapes; coatings for metal, paper, fabrics, carpets; protective (stripable) for saturating paper, felt, book covers, tape, jute pads; for dipping tire cords. Can be applied by spraying, spreading, impregnation, saturation.

"Disperson" [Witco]. TM for wettable grades of zinc, calcium, and other metallic stearates.
Use: Where easy dispersion in water is desired.

"Disperson OS" [IC]. TM for an oil-soluble emulsifying agent comprised of an 8% solution of a polyethenoxy compound in isopropanol. Designed especially for dispersion of oil spills in seawater. Claimed to be biodegradable and to have low toxicity for fish and other marine organisms. Amount needed said to be from 20-25% of the oil volume.

displacement. Chemical change in which one element enters a compound in place of another, the latter being set free.

displacement series. See activity series.

disposal, waste. See waste control, chemical waste, radioactive waste.

disproportionation. A chemical reaction in which a single compound serves as both oxidizing and reducing agent and is thereby converted into a more oxidized and a more reduced derivative. Thus, a hypochlorite upon appropriate heating yields a chlorate and a chloride, and an ethyl radical formed as an intermediate is converted into ethane and ethylene.
See also transalkylation.

dissociation. The process by which a chemical combination breaks up into simpler constituents as a result of either (1) added energy, as in the case of gaseous molecules dissociated by heat, or (2) the effect of a solvent on a dissolved polar compound (electrolytic dissociation), e.g., water on hydrogen chloride. It may occur in the gaseous, solid, or liquid state or in solution. All electrolytes dissociate to a greater or less extent in polar solvents. The degree of dissociation can be used to determine the equilibrium constant